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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/051,640 | 01/18/2002 | Yifan Gong | TI-32328 | 8058 |

23494 7590 08/19/2005

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EXAMINER

YOUNG, DONALD G

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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2654

DATE MAILED: 08/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/051,640

Applicant(s)

GONG, YIFAN

Examiner

Donald Young

Art Unit

2654

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01/18/2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☒ Claim(s) 4, 9, 14 and 17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Information Disclosure Statement

1. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Claim Objections

2. **Claims 4, 9, 14 and 17** are objected to because of the following informalities: Claims 4, 9 and 14 contain a period after the word used and, before the declaration of the probability equations. The inadvertent period makes the entire scope of the claim unclear and questionable. The examiner suggests the period be removed from the claim as a satisfactory revision. Claim 14 also contains a period after the term "C" in the first probability equation. This inadvertent period again makes claim 14 unclear and questionable. The examiner once again suggests the period be removed from the claim as a satisfactory revision. Claim 17 contains an error in spelling for the word "simultaneously." Appropriate correction is required.

Art Unit: 2654

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

4. **Claims 4, 9 and 14** rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 4, 9, and 14 disclose of a three probability equations. The second probability equation equates to the term "D". The third probability equation equates to the term "E". The two terms "D" and "E" need to be explicitly defined in the specification to make claims 4, 9 and 14 definite.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. **Claims 1-17** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-17 are drawn to a mathematical algorithm, per se. Claims to processes that do nothing more than solve mathematical problems or manipulate abstract ideas or concepts are non-statutory. If the "acts" of a claimed process manipulate only numbers, abstract

Art Unit: 2654

concepts or ideas, or signals representing all of the foregoing, the acts are not being applied to appropriate subject matter. Schrader, 22 F.3d at 294-95, 30 USPQ2d at 1458-59. This, a process consisting solely of mathematical operations without some claimed practical application is drawn to non-statutory subject matter. In this case, the claims merely recite the steps of: calculating the (MFCC) vector, adding the mean (MFCC) vector to the mean vectors of HMM models, calculating an estimate of the background noise, calculating the HMM model mean vectors adapted to noise, calculating the mean vector of the noisy data, and removing the mean vector of the noisy data from the HMM model mean vectors without any practical application being recited.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. **Claim 17** is rejected under 35 U.S.C. 102(b) as being anticipated by Shozakai et al. (ECSCT 1997).

Regarding claim 17, Shozakai et al. disclose a method of speech comprising the steps of:

Art Unit: 2654

- providing HMM models trained on clean speech with cepstral mean normalization; and modifying HMM models to compensate simultaneously for convolutive (multiplicative) distortion and background (additive) noise (page 3).

Allowable Subject Matter

8. The following is a statement of reasons for the indication of allowable subject matter: Independent claims 1, 6, 11 and 16 are allowable because the prior art of record does not disclose or suggest of determining the target HMM model compensated for additive noise and convolutive noise using Cepstral Mean Normalization and Parallel Model Combination. It is known in the prior art to remove the distorted noise from the input model to get the target model. See e.g., Hirsch, Yamamoto et al., and Shozakai et al. However, the prior art does not disclose or suggest calculating these quantities with these equations. Applicant's specification, pages 2 to 3, discloses a joint CMN/PMC model to provide a robust speaker independent system that handles a variety of noises and channel distortions simultaneously.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donald Young whose telephone number is (571) 272-8134. The examiner can normally be reached on 8:30 a.m. to 5:00 p.m. Monday through Friday.

Art Unit: 2654

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Talivaldis Smits can be reached on (571) 272-7628. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DGY

07/25/2005


RICHEMOND DORVIL
SUPERVISORY PATENT EXAMINER